

ABSTRACT

A miniature electrical relay including a piezoelectric actuating element where the piezoelectric actuating element includes a piezoelectric thin-film material sandwiched in between two metal electrode layers that function as piezoelectric electrodes. The metal electrode layers are connected to a positive and negative terminal, respectively, of a power source, which results in actuation of the piezoelectric actuating element. The piezoelectric actuating element is affixed to a deformable metal contact through an insulating layer, such that when actuated, the piezoelectric actuating element selectively deforms the deformable metal contact to cause the contact to move into or out of electrical and mechanical connection with a fixed metal contact. A method of making the miniature piezoelectric includes providing a support structure, depositing a first contact on a first portion of the support structure, depositing a second contact on a second portion of the support structure, wherein the second contact is deformable with respect to the first contact for selectively engaging the first contact, and fabricating a piezoelectric actuator that selectively deforms the second contact relative to the first contact.